



Editorial

Some Thoughts on Hand-Rolled Cigarette[☆]

Algunas consideraciones sobre el tabaco de liar

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Over the last few months, there has been an on-going debate in Spain about roll-your-own (RYO) tobacco in the media¹ and in public opinion, a phenomenon that has already been widely analyzed and discussed for many years in English-speaking countries and Europe. The public sale of RYO tobacco in Spain increased 60% in 2010 (200% since 2007), and this has been explained by the fact that RYO cigarettes are cheaper than manufactured cigarettes (MC). It has also been argued that they have fewer additives, making them less noxious than MC. These facts are doubly worrying as it means that RYO tobacco consumption is more easily accessible to minors and, furthermore, as it is less expensive, it is a refuge for those smokers who, for economic reasons, might contemplate quitting. Usually, RYO products are promoted during economic crises and when anti-tobacco legislation is up for approval, and both circumstances currently coincide in Spain.² This leads us to ask, "Is RYO tobacco really less noxious and addictive, or is it simply cheaper and trendy?"

The prevalence in the Spanish population of RYO cigarette consumption in 2008 was 8.7% (survey by the National Committee for Smoking Prevention,³ as this data was not found in the national health surveys), and it is most definitely higher today. In countries like the United States, Canada, Great Britain, Australia, France, Norway, and New Zealand, RYO use has increased partly due to the tax hikes on MC, driving smokers towards cheaper tobacco.⁴ In some of these countries, for example Great Britain, the consumption has doubled in a decade.⁵ The prevalence of RYO in these developed countries at the beginning of the last decade varied from 28.8% in Great Britain to 6.7% in the US, while it reached 24.3% in Australia and 17.1% in Canada,⁶ without much variation over the course of the years studied.⁷ The prevalence is slightly higher in some Asian countries, such as Thailand (32.9%).⁸

In general it has been found that the consumption of RYO cigarettes over MC is more prevalent in men, usually of younger ages (although not all studies relate a younger age with smoking RYO, it does seem that young people are more likely to later

consume MC⁹), with less income, married or in a relationship and with a lower educational level. In addition, they tend to inhale the smoke more deeply, present greater nicotine dependence, are less motivated to quit and believe that RYO tobacco is less harmful for their health.⁶ Laugesen et al.,¹⁰ in a study whose objective was to register the pattern of consumption and immediate toxicity in RYO cigarette smokers compared with MC smokers, found that both types of smokers have a similar daily consumption as well as a practically identical time elapsed between getting out of bed and the first cigarette of the morning. The pattern of consumption was not different between the two types of cigarettes, although it was observed that the first cigarette of the day of the RYO smokers weighed less and burned a smaller quantity of tobacco. The RYO smokers smoke the subsequent cigarettes with greater intensity, have less tobacco per cigarette, inhale a greater amount per cigarette with a greater number of puffs per cigarette and with longer puffs than MC smokers. In addition, RYO cigarette smokers inhale a greater concentration of carbon monoxide when adjusted for the amount of tobacco. Shabab et al.⁵ have characterized the puffing behavior by comparing RYO and MC smokers and found that RYO smokers have a tendency to take more puffs per cigarette and that these puffs are also longer.

With regards to the belief about the harmfulness of the different types of tobacco, O'Connor et al.⁷ found that 25% of their survey participants thought that pipe tobacco as well as pure and RYO tobacco were less harmful than MC. There were, however, significant differences in this aspect among the countries surveyed. Canadians are less likely to believe that such tobacco is less harmful, while Australians are more likely to believe so. The characteristics associated with thinking that RYO cigarettes are less harmful include being under the age of 25, male, Caucasian, with a high level of education and sporadic RYO cigarette use.

Additives are added to tobacco in order to increase the portion of free-base nicotine, which augments its addictive power. It is well known that the alkalizing effect of ammonia, which increases the proportion of nicotine in tobacco smoke, makes it more easily absorbed by the airway.¹¹ In addition, the additives are used to improve the taste and smell of the tobacco, making the product more desirable. Calculated according to the weight of the cigarette, MC have at least 10% of additives, and when this was compared with the same brand of RYO tobacco, the latter had up to 22% of

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additives.^{12,13} Fully aware that MC are manufactured equally and are therefore reproducible in size and weight while RYO cigarettes depend on how the user rolls them, Darral and Figgins,¹⁴ wanted to identify the differences in the substances found in the two types of cigarettes. The authors found that if the cigarette paper is more porous, the level of substances is lower in general, and if a filter is used, this has little effect on the levels of carbon monoxide (CO), although it does reduce the quantity of nicotine and tar. In general, RYO users tend to use a homogeneous quantity of tobacco in all their rolled cigarettes, with little variation. The level of nicotine per MC in the United Kingdom is declared to be above approximately 1.1 mg/cig in 8% of the brands; meanwhile, the authors of this study¹⁴ found that this level was surpassed in 77% of RYO tobacco brands, while also finding high levels of tar and CO. *Bidis*, which are very popular roll-your-own cigarettes in India that have gained in popularity in the Western world, especially among adolescents, are made of tobacco rolled up in a tendu leaf. It is known that when smoking these cigarettes, a greater quantity of nicotine, tar and CO are inhaled than with MCs, which makes them more addictive¹⁵ and harmful to one's health. Furthermore, they also contain carcinogenic substances such as nitrosamines¹⁶ in quantities similar to conventional cigarettes and directly alter the antioxidant state, inducing atherogenicity.¹⁷

Several studies have analyzed the carcinogenic substances in RYO cigarettes. Shabab et al.⁴ compared the exposure to stable carcinogens (1-hydroxypyrene; 1-HOP and 4-methyl-nitrosamine-1-3-pyridyl-4-butanol; NNAL) between RYO and MC, finding no differences in the urinary concentrations of 1-HOP and NNAL when adjusted for creatinine between the two types of cigarettes. The level of cotinine did have a significant association with the concentrations of 1-HOP and NNAL; the greater the amount of cotinine, the greater the urinary concentration of both carcinogens. Furthermore, women had significantly higher levels of 1-HOP and NNAL than men, regardless of the type of cigarette smoked. Years ago, different authors, such as Appel et al.,¹⁸ found higher levels of benzo(a)pyrenes in RYO than in MC, as well as stable concentrations of benzenes. Kaiserman and Rickert¹⁹ likewise obtained mid-to-high levels of benzo(a)pyrenes in RYO tobacco.

It is equally well known that RYO smokers are less prone to stop smoking,⁶ probably because they believe that these cigarettes are less harmful and more "natural"; meanwhile, in addition to being less motivated to quit, they also make fewer attempts at abstinence.⁹ Li et al.²⁰ analyzed the characteristics for stopping smoking by comparing RYO, MC, and "combination" consumers who smoked both. The authors found that the type of tobacco is not a factor that contributes to a greater probability of stopping, but there are instead socioeconomic characteristics and those related to the smoker as well as the intensity of the cessation program that influence reaching higher abstinence rates.

Thus, we can conclude that RYO cigarettes present higher levels of additives, stable levels of carcinogens, tar, carbon monoxide, and higher levels of nicotine, which make them more addictive, which results in the higher nicotine dependence of RYO smokers. In addition, it must be considered that the proportion of substances in RYO cigarettes vary depending on the manner of rolling of each user, therefore the quantities of noxious substances could potentially be even higher. What we are able to confirm is that they are at the very least as harmful to one's health as manufactured

cigarettes. If RYO tobacco is being consumed because it is currently "the fashion", we hope that this trend changes soon. Unfortunately, we are more inclined to believe that the cause for debate about RYO tobacco is not a mere trend, and that its boom in popularity is due to sales strategies aimed at not losing this market or the non-smoking debate, while trying to avoid that smokers quit smoking by offering them cheaper tobacco, and at the same time making it more accessible to those who are becoming initiated in cigarette consumption. Nevertheless, although more studies are needed, for now it does not seem that quitting smoking is more difficult for RYO than for MC smokers.

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